

Natural Gas Engine Conversion System

"In 1989, we at Yugo-Tech realized that the Natural Gas Vehicle (NGV) equipment required to meet mid-1990's vehicle emissions standards did not exist. The equipment had to have the capabilities of controlling the engine air-to-fuel ratio to tight bandwidth limits, in order to prevent fuel wastage and reduce engine exhaust emissions. In 1990 Yugo-Tech commenced an extensive research and development effort aimed at achieving these goals. The Advanced Gas Inducer System developed at Yugo-Tech is capable of these stringent emission limits. The Ministry's assistance has enabled us to develop a system that offers excellent vehicle performance with reduced exhaust emissions, is competitive in the Ontario market, and has attracted substantial attention in international markets."

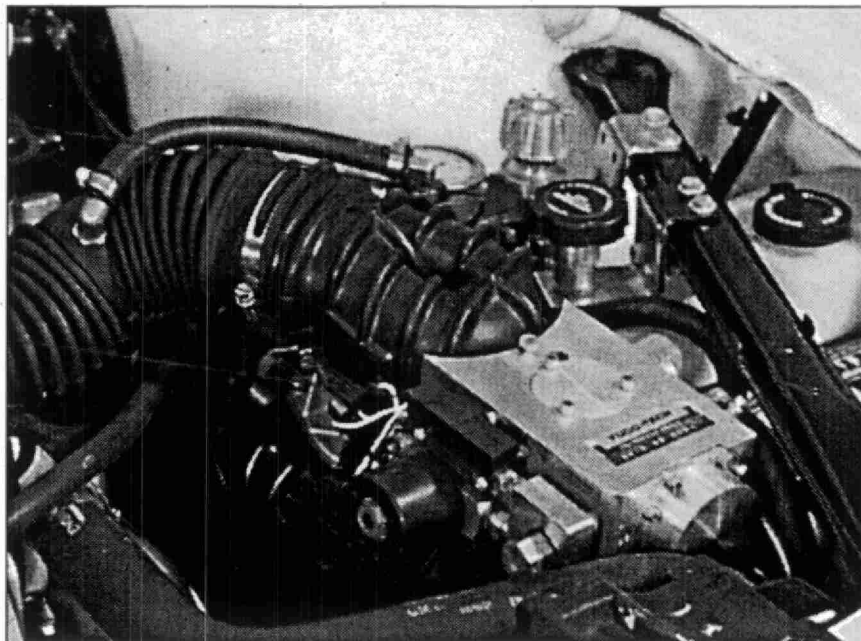
Michel Lahaye
Yugo-Tech, Mississauga, Ontario

THE COMPANY

Founded in 1986, Yugo-Tech is Ontario's oldest and largest distributor of natural gas vehicle (NGV) conversion equipment. The company's clients include Union Gas, Ontario Hydro, Centra Gas, Ontario Bus Industries, Federal Express, Etobicoke and Brampton.

THE CHALLENGE

The NGV equipment required to meet the vehicle emissions standards of the 1990's does not exist right now. But Yugo-Tech is working to fill that gap. In 1990, Yugo-Tech began an extensive research and development project to produce equipment capable of meeting these standards. Such equipment would have to control



A.G.I.S. Unit

the engine air-to-fuel ratio closely to prevent the wasting of fuel and to reduce exhaust emissions from the engine. Further, the equipment would have to be easier to install and easier to adjust than the equipment now on the market and would have to be priced competitively with its imported counterpart.

THE SOLUTION

Yugo-Tech developed its Advanced Gas Inducer System (AGIS) in two distinct phases. The first phase involved the design and field test of a positive pressure, sonic gas-metering, induction injection system. The system met its target goals. The positive pressure injection system exceeded 1994 Canadian vehicle exhaust emissions standards. In addition, it was also easy to install and adjust which is essential for export markets.

In the second phase, Yugo-Tech had to develop microprocessor-based electronics equipment which could monitor the engine and adjust the air/gas ratio to plus or minus one per cent precision. The electronic unit targeted the mid-1990's emissions standard or what is referred to as the "California standard". A successful AGIS project would give Yugo-Tech one of the most advanced and fuel efficient NGV conversion systems available.

The AGIS Phase II system has been installed in some 30 vehicles. Preliminary field tests indicate that the Phase II system will maintain the air/fuel ratio to plus or minus one per cent of the ideal value. This suggests that the units will be eight to 10 per cent more fuel efficient than imported systems. The AGIS units are now undergoing field trials and final emissions testing.



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OPPORTUNITIES

Yugo-Tech has reached a point where it is now competitive in international markets. The company is currently negotiating with five different countries on the sale and service of NGV conversion equipment. The Canadian market also is active as environmentally aware companies seek to "green" their fleets and reduce vehicle fuel costs.

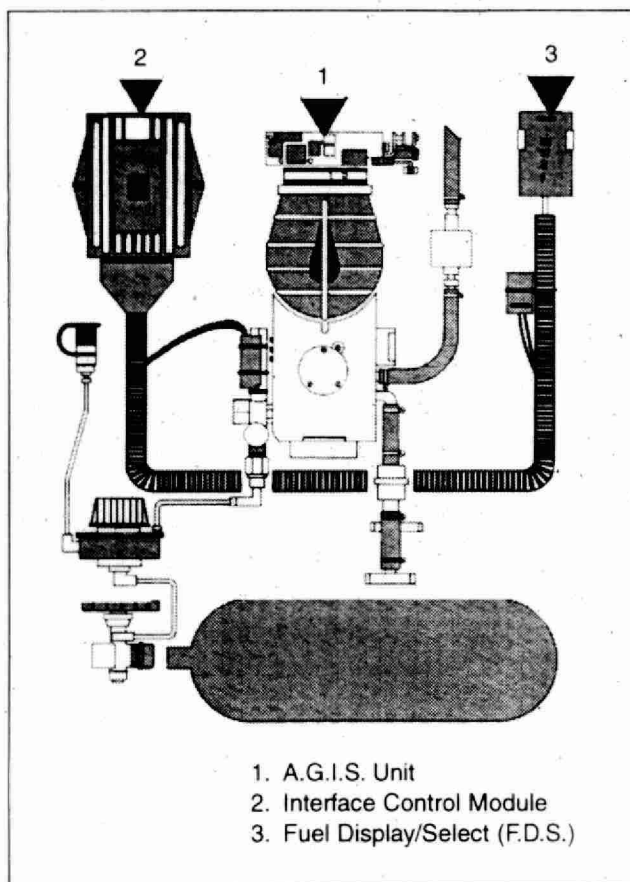
FINANCIAL INFORMATION

Phase I:

* Total cost:	\$117,600
* MOEE funding:	\$ 43,800
* Canadian Gas Association:	\$ 30,000

Phase II:

* Total Cost:	\$194,700
* MOEE funding:	\$ 97,350
* MOEE funding (to date):	\$ 55,000



YUGO-TECH Engine Conversion System

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Industrial companies located in Ontario may seek ministry/industry services that will help them to:

- * reduce, reuse and recycle solid waste;
- * reduce or eliminate liquid effluent and gaseous emissions;
- * use energy and water more efficiently.

Equipment and services supply companies can benefit from the information provided on technologies identified for business development.

FOR FURTHER INFORMATION, PLEASE CONTACT:

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